Dissolved Oxygen in Water

Topic: Water

Objectives: Measure the amount of oxygen dissolved in a water sample

Grade Level: 6 - 12

Time: 15 – 20 minutes

Materials: bucket, rope, dissolved oxygen test kit, 250-mL polyethylene bottle with top, latex gloves, safety goggles, waste bottle, writing pads, pens or pencils

Location: Lake Clara Meer, Clear Creek

Vocabulary:
oxygen
dissolve

Background: The ability of plant and animal life to survive in a body of water depends closely on the amount of dissolved oxygen in the water. In this activity you will measure the amount of dissolved oxygen in Lake Clara Meer or in Clear Creek.

Procedure:

1. Tie the rope securely to the handle of the bucket. Holding the rope, toss the bucket into the water at the water site and allow it to fill about 2/3 full with water. Carefully lift the bucket out.

2. Remove the cap from the 250-mL sampling bottle and rinse it thoroughly with the water to be tested.

3. Replace the cap on the bottle.

4. With the cap on the sampling bottle, completely submerge it in the bucket of sample water. Allow the bottle to fill completely.

5. Tap the bottle while it is still submerged to release air bubbles. While the bottle is still under water, replace the cap.

6. Remove the capped sample bottle from the bucket and check to see that there are no bubbles present in the bottle.

7. Follow the instructions on the dissolved oxygen test kit carefully. Record the value of dissolved oxygen.

8. When the test is complete, put all liquids in the waste bottle.

Questions to think about and discuss:

Water is made of molecules of hydrogen and oxygen, but this is not where fish and other aquatic animals obtain the oxygen they require to breathe. The oxygen they breathe is found in molecules of oxygen gas that are dissolved in the water. If there is not enough of this dissolved oxygen in the water, aquatic life suffocates. For normal growth and development most aquatic organisms require a dissolved oxygen level of at least 6 parts per million.

Several factors can affect the amount of dissolved oxygen in water. Some things that tend to increase dissolved oxygen levels are turbulence in the water, cool temperatures, and photosynthesis by aquatic plants. Organic matter from dead plants and animals in the water or from sewage tend to lower the amount of dissolved oxygen in the water. Warm temperatures and still water also decrease the amount of dissolved oxygen.

1. Is there sufficient dissolved oxygen in Lake Clara Meer or Clear Creek for healthy aquatic life? What might account for the dissolved oxygen level that you found with your measurement?

2. What do you think would have happened to your measurement if you had first stirred the water vigorously?

3. How do you suppose the amount of dissolved oxygen in your sample might change if you measured it on a different day or at a different time of year?